

FIG. 1

```
fz3/mouse -----MAVSWIVFDLWLLTVFLG---QIGGHS-----LFSCE
fz4/mouse -----MAWPGTGPS---SRGAPGGVGLRLGLLLQFLLLLRP TLGFGD-----EEERRCD
fz8/mouse -----MEWGYL-----LEVTSLLAALAVLQRSSG-AAAASAK-----ELACQ
fz5/human -----MARPD P-----SAPPSLL--LLLLAQLVG-RAAAASK-----APVCQ
fzd9/human -----MAVAPLRGALLWQLLAAGGALEIGRFD-----PERGRG-----AAPCQ
fz1/rat LEAPLLLGVRAQPAG---QVSG-PGQQRPPPPQPQQGG--QYNGERG--ISIPDHGYCQ
fz2/rat -----MRARSAL---PRSALPRLLLPLLLLPAAGP--AQFHGEKG--ISIPDHGFCQ
fz/Dros ILPTLIQGVQRYDQS---PLDASPYRSGGGLMASSG---TELDG-----LPHHNRC E
fz2/Dros/ GLVLLLTSCRADGPL-----HSADHGMGGMGMGGHGLD-ASPAPGYGVP AIPKDPNLRCE
```

*

fz3/mouse	PITLRMCQDLPYNTTFMPNLLNHYDQQTAAALAMEPFHPMVNLDCSRDFRPFLCALYAPIC
fz4/mouse	PIRIAMCQNLGYNVTKMPNLVGHELQTDDELQLTFTFTPLIQYGCSSQLQFFLCSVYVPMC
fz8/mouse	EITVPLCKGIGYNYTYMPNQFNHDTQDEAGLEVHQFWPLVEIQCSDDLKFFLCSMYTPIC
fz5/human	EITVPMCRGIGYNLTHMPNQFNHDTQDEAGLEVHQFWPLVEIQCSDDLRFLLCTMYTPIC
fzd9/human	AVEIPMCRGIGYNLTRMPNLLGHTSQGEAAAEAEFAPLVQYGCCHSLRFFLCSLYAPMC
fz1/rat	PISIPLECTDIAYNQTIMPNLLGHTNQEDAGLEVHQFYPLVKVQCSAELKFFLCSMYAPVC
fz2/rat	PISIPLECTDIAYNQTIMPNLLGHTNQEDAGLEVHQFYPLVKVQCSPELRFLLCSMYAPVC
fz/Dros	PITISICKNIPYNMTIMPNNLIGHTKQEEAGLEVHQFAPLVKIGCSDDLQLFLCSLYVPVC
fz2/Dros/	EITIPMCRGIGYNMSTFPMEMNHETQDEAGLEVHQFWPLVEIKCSPDLKFFLCSMYTPIC
	: : * : ** : ** . * * : : * : : * : : ** : * :

fz3/mouse	M-EYGRVTLPCRRLCQRAYSECSKLMEMFG-VPWPEDMECSRFPDCD-EPYPRLVDLN--
fz4/mouse	TEKINIPIGPCGGMCLSVKRRCEPVLREFG-FAWPDLTNCSKFPPQN-DHNHMCMEGP--
fz8/mouse	LEDYKKPLPPCRSVCERAKAGCAPLMRQYG-FAWPDRMRCDRLPEQG-NPDTLCMDYN-R
fz5/human	LPDYHKPLPPCRSVCERAKAGCSPLMRQYG-FAWPERMSCDRLPVLGRDAEVL CMDYN-R
fzd9/human	TDQVSTPIACRPMCEQARLRCAIMEQFN-FGW PDSLDCARLPTRN-DPHALCMEAPEN
fzl/rat	T-VLEQALPPCRSLCERA-QGCEALMNKFG-FQWPD TLKCKEFVHG--AGELCVGQNTS
fz2/rat	T-VLEQAIPP CRSICERARQGCEALMNKFG-FQWPERLRCEHFPRHG--AEQICVGQNHS
fz/Dros	T-ILERPIPPCRSLCESA-RVCEKLMKTYN-FNW PENLECSKFVHG--GEDLCVAENTT
fz2/Dros/	LEDYHKPLPVCRSVCERARSGCAPIMQQYS-FEW PERMA CEHLPLHG-DPDNL CMEQPSY
	* * * ** . * . *

FIG. 2A

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fz3/mouse -----LVGDPTE--
 fz4/mouse ---GDEE-----VPLPHKTP-
 fz8/mouse TDLTTAAPSPRRLLPPPPPPGEQPPSGSGHSRPPGARPPHRGGSSRGSGDAAAAPPSRGG
 fz5/human SEATTAPPRP---FPAKP---TLP--G---PP-----G---APAS-GG
 fz9/human ATAGPAEPHK---GLGM---LP-----VAPRPARPPG
 fz1/rat DKGTPTPSL-----L-----PEFWTSNPQHG
 fz2/rat EDG--TPAL-----L-----TTAPPSGLQPG
 fz/Dros SSA-----STAATPTRSVA
 fz2/Dros/ TEAGSGGSSG---GSGG---SGSGSGSGGKRKQGGSGSGSGAGGSSGSTSTKPCR-GR
 amino terminal domain continued

TM1
 fz3/mouse YSFLHVRDCSPPCPN-----MYFREELSFARYFIGLISIICLSATLFTFLTLIDVTR
 fz4/mouse --LNCVLKCGYDAG-----LYSRSAKEFTDIWMAVWASLCFISTFTVLTLIDSSR
 fz8/mouse -KTQQIANCALPCHN-----PFFSQDERAFTVFWIGLWSVLCFVSTFATVSTFLIDMER
 fz5/human -RTGQVPNCAVPCYQ-----PSFSADERTFATFWIGLWSVLCFISTSTTVATFLIDMDT
 fz9/human --RSCAPRCGPGVEV-----FWSRRDKDFALVWMAVWSALCFFSTAFTVLTLFLEPHR
 fz1/rat LG EK---DCGAPCEPTKVYGLMYFGPEELRFSRTWIGIWSVLCCASTLFTVLTYLVDMRR
 fz2/rat LGER---DCAAPCEPARPDGSMFFSHHHTREFARLWILTWSVLCCASTFFTVTTSVLAMQR
 fz/Dros VGGKDLHDCGAPCH-----AMFFPERERTVLRWVGSWAAVCVASCLFTVLTLIDSSR
 fz2/Dros/ QRIAGVPNCGIPCKG-----PFFSNDEKDFAGLWIALWSGLCF CSTLMTLTTFIIDTER
 * : : * : *

TM2 → extracellular domain loop 1
 fz3/mouse FRYPERPIIFYAVCYMMVSLIFFIGFLE-DRVACNASSP-----
 fz4/mouse FSYPERPIIFLSMCYNIYSIAYIVRLTVGRERISCDF-----
 fz8/mouse FKYPERPIIFLSACYLFVSVGYLVRLVAGHEKVACSGGAPGAGGRGGAGGAAAAGAGAAG
 fz5/human FRYPERPIIFLSACYLCVSLGFLVRLVVGHASVACS-----
 fz9/human FQYPERPIIFLSMCYNVYSLAFLIRAVAGAQSACD-----
 fz1/rat FSYPERPIIFLSGCTAVAVAYIAGFLE-DRVVCNDKFAE-----
 fz2/rat FRYPERPIIFLSGCTMVSVAYIAGFVLQ-ERVVCNERFSE-----
 fz/Dros FRYPERAIVFLAVCYLVGCAYVAGLGAG-DSVSCREFPFPPVK---LG-----
 fz2/Dros/ FKYPERPIVFLSACYFMVAVGYLSRNLQNEEIACDG-----
 * **** : : * . ** . : .

FIG. 2B

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	TM3
fz3/mouse	-----AQYKASTVTQGSNK- [←] ACTMLFMVLYFFTMAGSVWWVILTTWFLA
fz4/mouse	-----EEAAEPVLIQEGLNKGCAIFLLMYFFGMASSIWWVILTLTWFLA
fz8/mouse	RGASSPGARGEYEEELGAVEQHVRYYETGPALCTVVFLVYFFGMASSIWWVILSLTWFLA
fz5/human	R-----EHNHIHYETGPALCTIVFLLVYFFGMASSIWWVILSLTWFLA
fzd9/human	-----QEAGALYVIQEGLENTGCTLVFLLLYFFGMASSLWWVLTLTWFLA
fz1/rat	-----DGARTVAQGTKKE-GCTILFMMLYFFSMASSIWWVILSLTWFLA
fz2/rat	-----DGYRTVCGGTKKE-GCTILFMMLYFFSMASSIWWVILSLTWFLA
fz/Dros	-----RLQMMSTITQGHRTTSCTVLFMALYFCCMAFAWWSCLAFWFLA
fz2/Dros/	-----LLLRESSTGPHSCTLVFLLTYFFGMASSIWWVILFTTWFLA
	: * :: : ... ** ::: :*:
	TM4 → extracellular domain loop 2 ←
fz3/mouse	AVPKWGSEAEKKALLFHASAWGIPGTLTITILLAMNKIEGDNISGVCVFGLYDVALRYF
fz4/mouse	AGLKWGHEAIEMHSSYFHIAAWAIPAVKTIVILIMRLVDADELGLCYVGNQNLDAITGF
fz8/mouse	AGMKWGNEAIAAGYSQYFHAAWLVPVSVKSI AVLALSSVDGDPVAGICYVGNQSLNLRGF
fz5/human	AAMKWGNEAIAAGYQYFHAAWLIPSVKSIT ALALSSVDGDPVAGICYVGNQNLNLSRRF
fzd9/human	AGKKWGHEAIEAHGSYFHMAAWGLPALKTIVILT LRKVAGDELGLCYVASTDAAALTGF
fz1/rat	AGMKWGHEAIEANSQYFHAAWAVPAIKTITILALGQVDGDLGVCVFGVGLNNDALRGF
fz2/rat	AGMKWGHEAIEANSQYFHAAWAVPAVKTITILAMGQIDGDLGVCVFGVGLNRLDPLRGF
fz/Dros	AGLKWGHEAIEENKSHLFHLVAVAPALQTISVLALAKVEGDILSGVCVFGQLDTHSLGAF
fz2/Dros/	AGLKWGNEAITKHSQYFHAAWLIPVQSVAVLLL SAVDGDPIIGICYVGNLNPDLKTF
	: ** * : . ** ** * . : * : : . : * : *
	TM5
fz3/mouse	VLAPLCLYVVGVSLLAGIISINRVRIEIPLEKE-----NQDKLVKFMIRIGVFSILYL
fz4/mouse	VVAPLFTYLVIGTLFIAAGLVAFKIRSNLQK-DG-----TKTDKLERLMVKIGVFSVLYT
fz8/mouse	VLAPLVIYLFITGTMFLLAGFVSLFRIRSVIKQGGP---TKTHKLEKLMIRLGLFTVLYT
fz5/human	VLGPLVLYLLVGTFLFLLAGFVSLFRIRSVIKQ-GG-----TKTDKLEKLMIRIGIFTLLYT
fzd9/human	VLVPLSGYLVLGSSFLLTGFVALFHIRKIMKT-GG-----TNTEKLEKLMVKIGVFSILYT
fz1/rat	VLAPLFVYLFITGSFLLAGFVSLFRIRTIMKH-DG-----TKTEKLEKLMVRIGVFSVLYT
fz2/rat	VLAPLFVYLFITGSFLLAGFVSLFRIRTIMKH-DG-----TKTEPLERLMVRIGVFSVLYT
fz/Dros	LILPLCIYLSIGALFLLAGFISLFRIRTMKT-DG-----KRTDKLERLMRIGFFSGLFI
fz2/Dros/	VLAPLFVYLVIGTTFMAGFVSLFRIRSVIKQGGVGVAGVKADKLEKLMIRIGIFSILYT
	: * : * : . * :: : . : : : * :

FIG. 2C

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	TM6	extracellular domain loop 3	
fz3/mouse	VPLL [→] VIGCYFYEQAYRGIWETTWIQERCREYHIPCPYQVTQMS	-----	RPDLILFLM [←]
fz4/mouse	VPATCVIACYFYEISNWALFRYSADDS	-----	NMAVEML
fz8/mouse	VPA [→] AVVACLFYEQHNRPRWEATHNCPCLRDLPDQARR	-----	PDYAVFML
fz5/human	VPASIVVACYLYEQHYRESWEAALTCACPGHDTGQPRAK	-----	PEYWVLM
fzd9/human	VPATCVIVCYVYERLNMDFWRLRATEQPCAAAAGPGRRDCSLP	----	GGSVPTVAVFML
fzl/rat	VPATIVIACYFYEQAFRDQERSWVAQCKSYAIPCPHLQGGGVPPHPPMSPDFTVEMI		
fz2/rat	VPATIVIACYFYEQAFREHWERSWVSQHCKSLAIPCPAHYT	-----	PRTSPDFTVYMI
fz/Dros	LPAVGLLGCLFYEYNFDEWMIQWHRDICKPFSIPCPAARAPGS	----	PEARPIFQIFMV
fz2/Dros/	VPATIVIGCYLYEAA [→] YFEDWIKALACPCAQVK	--GPGKK-----	PLYSVLM
	* : . . *		::
	TM7		
fz3/mouse	KYLMALIVGIPSI [→] FWVGSKKTCEWASFFHGRKKEIVNESRQVLQEPDFAQSLLRDPNT		
fz4/mouse	KIFMSLLVGITSGMWIWSAKTLHTWQKCS	-----	NRLVNSGKVK-----REKRG
fz8/mouse	KYFMCLVVGITSGVWVWSGKTLESWRALC	-----	TRCCWASKGA [→] AVGAGAGGSG
fz5/human	KYFMCLVVGITSGVWVWSGKTVESWRRFT	-----	SRCCCRPR-----RGHK-
fzd9/human	KIFMSLVVGITSGVWVWSKTFQTWQSLC	-----	YRKIAAGRARA----KACRA
fzl/rat	KYLMTLIVGITSGFWIWSGKTLNSWRKFY	-----	TRLTNSK-----QGETT
fz2/rat	KYLMTLIVGITSGFWIWSGKTLHSWRKFY	-----	TRLTNSR-----HGETT
fz/Dros	KYLC [→] SMLVGVTSVWLYSSKTMVSWRNFV	-----	ERLQGEPR-----RAQAY
fz2/Dros/	KYFMALAVGITSGVWVWSGKTLESWRRFW	-----	RRLGAPDRTGANQALIKQR
	: : : * : .*: * ** :		

FIG. 2D

Sequence alignment of a portion of the aminoterminal extracellular region of human Frizzled receptors

HFZ1	VGQNTSDKGT---PSLLPEFWTSNPQHGGGCHRG	-----	GPPGGAG---ASERGFSCPR
HFZ2	VGQNHSE [→] DGA---PALTTAPPPGLQPGAGGTPG	-----	GPGGGGAPPRYATLEHPHC
HFZ3	LVDLNL [→] AG----EPTEGAPV	-----	AVQRDYG-----FWC
HFZ4	CMEGPGD-----EE	-----	VPLPHKTPI-----QP
HFZ5	CMDYNRSEATTAPPRPFAKPTLPG	-----PPGA-----	PASGG---ECPAGGPV-----CKC
HFZ6	TFDPHTEF-----LGPQKTE	-----	QVQRDIG-----FWC
HFZ7	VGQNTSDGSGGPGGPTAYPTAPYLPDLPTALPPG	-----	ASDGRGRPAF-----PFSC
HFZ8	CMDYNRTDLTTAAPSPPRRLPPPP-GEQPPSGSGHCRPPGARPPHRRGGGGGGDAAAPARGGGGGGKARPPGGGAAP	----	CEPGCQC
HFZ9	CMEAPENA-TAGPAEPHKGLGMLPV	-----	APRPARPPG-----DLGP
HFZ10	NYLCMEAPNN---GSDEPTRGSGLFPP	-----	LFRPQRPHSAQ---EHP

FIG. 3

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Effect of FZD on SNU1076 cells

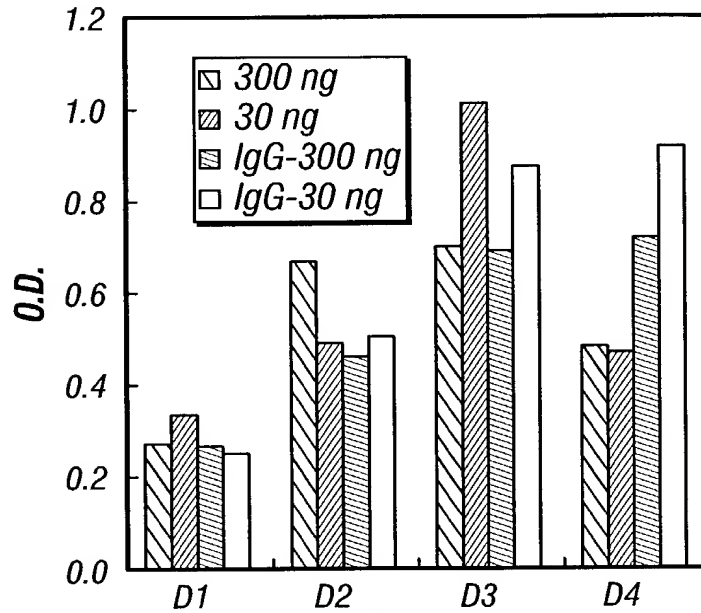


FIG. 4

Effect of antibodies SNU 1076 Cells

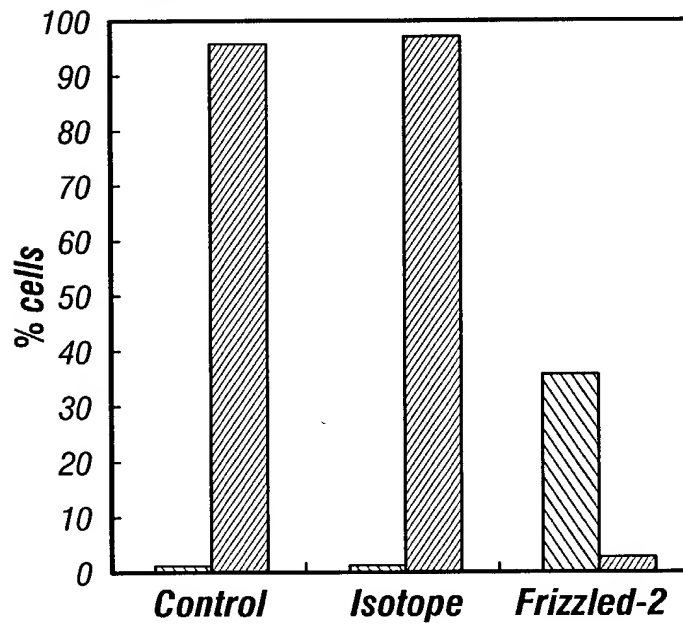


FIG. 5



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Effect of antibodies SNU 1076 Cells

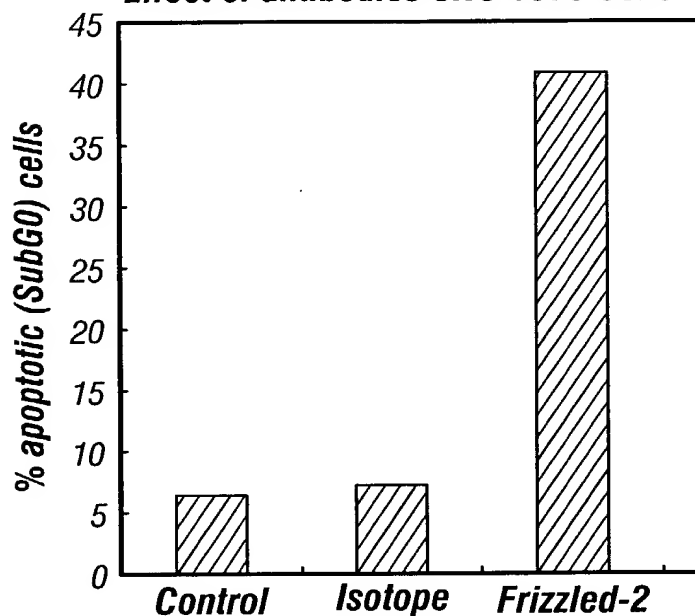


FIG. 6

→ amino terminal domain

HFZ1	MAEEEAPKKSRAAGGGASWELCAGALSARLAEEGSGDAGGRRRPPVDPRLARQLLLLLLW
MFZ1	MAEEAAPSESRAAGR-LSLELCAEALPGRREEVGHEDTASHRRPRADPRRWASGLLLLLLW
HFZ2	-----MRPRSALPRLLLPLL
HFZ3	-----MAMTWIVFSLWPLTV
MFZ3	-----MAVSWIVFDLWLLTV
HFZ4	-----MAWRGAGPSVPGAPGGVGLSLGLLLQ
MFZ4	-----MAWPGTGPSSRGAPGGVGLRLGLLLQ
HFZ5	-----MARPDPSAPPSLL--LLL
HFZ6	-----MEMFTLLTCI
MFZ6	-----MERSPFLACI
HFZ7	-----MRDPGAAAPLSSLGLCALVLA
MFZ7	-----MRGPGTAASHSPLGLCALVLA
HFZ8	-----MEWGYLLEVTSLAALAL
MFZ8	-----MEWGYLLEVTSLAALAV
HFZ9	-----MAVAPL-RGALLLWQLLA
MFZ9	-----MAVPPLLRGALLLWQLLA
HFZ10	-----MQRPGPRLWLVLQ

FIG. 8A

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HFZ1	LLEAPLLLGVRAQAAGQPGQPGPGQPPPPPPQQQSSGQYNGERGISVPDHGYCQPIS
MFZ1	LLEAPLLLGVRAQAAGQVSG----PGQQA PPPPQ PQSSGQYNGERGISIPDHGYCQPIS
HFZ2	LLPA-----A-----GPAQFHGEKGISIPDHGFCQPIS
HFZ3	FMGHI-----GGHSLFS-----CEPIT
MFZ3	FLGQI-----GGHSLFS-----CEPIT
HFZ4	LLLLLG-----PARGFGDEEE-----RRC DPIR
MFZ4	FLLLLR-----PTLGFGDEEE-----RRC DPIR
HFZ5	LAQLVG-----RAAAASKAPV-----CQEIT
HFZ6	FLPLL-----RGHSLFT-----CEPIT
MFZ6	LLPLV-----RGHSLFT-----CEPIT
HFZ7	LLGAL-----SAGAGA QPYHGEKGISVPDHGFCQPIS
MFZ7	LLGAL-----PTDTRA QPYHGEKGISVPDHGFCQPIS
HFZ8	LQRSSG-----AAAASAKELA-----CQEIT
MFZ8	LQRSSG-----AAAASAKELA-----CQEIT
HFZ9	AGGAAL-----EIGRFDPERGR---GAAPCQAVE
MFZ9	TGGAAL-----EIGRFDPERGR---GPAPCQAME
HFZ10	VMGSCA-----AISSMDMERP---GDGKCQPIE

*: .

HFZ1	IPLCTDIAYNQTIMP NLLGHTNQEDAGLEVHQFYPLVKVQCSAELKFFLCSMYAPVCT-V
MFZ1	IPLCTDMAYNQTIMP NLLGHTNQEDAGLEVHQFYPLVKVQCSAELKFFLCSMYAPVCT-V
HFZ2	IPLCTDIAYNQTIMP NLLGHTNQEDAGLEVHQFYPLVKVQCSPELRFFLCSMYAPVCT-V
HFZ3	LRMCQDLPYNTTFMP NLLNHYDQQTAAALAMEPFHPMVNLDCSRDFRPFLCALYAPICM-E
MFZ3	LRMCQDLPYNTTFMP NLLNHYDQQTAAALAMEPFHPMVNLDCSRDFRPFLCALYAPICM-E
HFZ4	ISMCQNLGYNVTKMPNLVGHELQTD AELQLTFTPLIQYGCSSQLQFFLCSVYVPMCTEK
MFZ4	IAMCQNLGYNVTKMPNLVGHELQTD AELQLTFTPLIQYGCSSQLQFFLCSVYVPMCTEK
HFZ5	VPMCRGIGYNLTHMPNQFNHDTQDEAGLEVHQFWPLVEIQSPDLRFFLCTMYTPICLPD
HFZ6	VPRCMK MAYNMTFFPNLMGHYDQSI AAVEMEHLPLANLECS PNIE TFLCKAFVPTCI-E
MFZ6	VPRCMK MTYNMTFFPNLMGHYDQGI AAVEMGHFLHLANLECS PNIE MFLCQAFIPTCT-E
HFZ7	IPLCTDIAYNQTILPNLLGHTNQEDAGLEVHQFYPLVKVQCSPELRFFLCSMYAPVCT-V
MFZ7	IPLCTDIAYNQTILPNLLGHTNQEDAGLEVHQFYPLVKVQCSPELRFFLCSMYAPVCT-V
HFZ8	VPLCKGIGYNYTYPNQFNHDTQDEAGLEVHQFWPLVEIQSPDLKFFLCSMYTPICLED
MFZ8	VPLCKGIGYNYTYPNQFNHDTQDEAGLEVHQFWPLVEIQSPDLKFFLCSMYTPICLED
HFZ9	IPMCRGIGYNLTRMPNLLGHTSQGEAAAE LAEFAPLVQYGCCHSLRFFLCSLYAPMCTDQ
MFZ9	IPMCRGIGYNLTRMPNLLGHTSQGEAAAE LAEFAPLVQYGCCHSLRFFLCSLYAPMCTDQ
HFZ10	IPMCKDIGYNMTRMPNLMGHENQREAAIQLHEFAPLVEYGCCHSLRFFLCSLYAPMCTEQ

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FIG. 8B

Title: IMMUNOLOGIC COMPOSITIONS AND METHODS FOR STUDYING
AND TREATING CANCERS EXPRESSING FRIZZLED ANTIGENS
Inventors: Dennis A. Carson, et al.
Application No.: 09/847,102
Docket No.: 220002062900

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HFZ1	LEQALPPCRSLCERARQGCEALMNKFGFQWPDTLKCEKFPVHG--AGELCVGQNTSDKGT
MFZ1	LEQALPPCRSLCERARQGCEALMNKFGFQWPDTLKCEKFPVHG--AGELCVGQNTSDKGT
HFZ2	LEQAIPPCRSICERARQGCEALMNKFGFQWPERLRCEHFPRHG--AEQICVGQNHSEDA
HFZ3	YGRVTLPCRRLCQRAYSECSKLMEMFGVPWPEDMECSRFPDCD-EPYPRLVDLNLG---
MFZ3	YGRVTLPCRRLCQRAYSECSKLMEMFGVPWPEDMECSRFPDCD-EPYPRLVDLNLVG---
HFZ4	INIPIGPCGGMCLSVKRRCEPVLKEFGFAWPESLNCSKFPPQN-DHNHMCMEGPGD----
MFZ4	INIPIGPCGGMCLSVKRRCEPVLREFGFAWPDTLNCSKFPPQN-DHNHMCMEGPGD----
HFZ5	YHKPLPPCRSVCERAKAGCSPLMRQYGFAPWPERMSCDRLPVLGRDAEVLCDYNRSEATT
HFZ6	QIHVVPPCRKLCEKVSDCKKLIDTFGIRWPEELECRLQYCD-ETVPVTFDPHTEF---
MFZ6	QIHVVLPCKRLCEKIVSDCKKLMDTFGIRWPEELECRLPHCD-DTVPVTSHPHTEL---
HFZ7	LDQAIPPCRSICERARQGCEALMNKFGFQWPERLRCEHFVHG--AGEICVGQNTSDGSG
MFZ7	LDQAIPPCRSICERARQGCEALMNKFGFQWPERLRCEHFVHG--AGEICVGQNTSDGSG
HFZ8	YKKPLPPCRSVCERAKAGCAPLMRQYGFAPWDRMRCRLPEQG-NPDTLCMDYNRTDLTT
MFZ8	YKKPLPPCRSVCERAKAGCAPLMRQYGFAPWDRMRCRLPEQG-NPDTLCMDYNRTDLTT
HFZ9	VSTPIACRPMCEQARLRCAPIEQNFQWPDSDLCARLPTRN-DPHALCMEAPENA-TA
MFZ9	VSTPIACRPMCEQARLRCAPIEQNFQWPDSDLCARLPTRN-DPHALCMEAPENA-TA
HFZ10	VSTPIACRVMCEQARLKCSPIEQNFQWPDSDLCKRLPNKN-DPNYLCMEAPNN----

. * : * * : : * : .

HFZ1	PT---PSLLPEFWTSNPQHGGGGHRG-----
MFZ1	PT---PSLLPEFWTSNGQHGGGGYRG-----
HFZ2	----PALLTAPPPGLQPGAGGTPG-----
HFZ3	---EPTGAPV-----A
MFZ3	---DPTGAPV-----A
HFZ4	----EE-----V
MFZ4	----EE-----V
HFZ5	APPRPFPKPTLPG-----PPGA-----PASGG-----
HFZ6	---LGPQKKTE-----Q
MFZ6	---SGPQKKSD-----Q
HFZ7	GPGGGPTAYPTAPYLPDLPFTALPPG-----
MFZ7	GAGGSPTAYPTAPYLPDPPFTAMSP-----
HFZ8	AAPSPPRRLPPPPP-GEQPPSGSGHGRPPGARPPHRGGGSGGGGDAAPPARGGGGGK
MFZ8	AAPSPPRRLPPPPPGEQPPSGSGHSRPPGARPPHRGSSRSGSDAAAPPSSRGG----K
HFZ9	GPAEPHKGLGMLPV-----A
MFZ9	GPTEPHKGLGMLPV-----A
HFZ10	GSDEPTRGSGLFPP-----L

FIG. 8C

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HFZ1 GFPGGAG----ASERGFSCPRALKVPSYLNHFLGEKDCGAPCEPTKVYGLMYFGPEEL
MFZ1 GYPGGAG----TVERGFSCPRALRVPSYLNHFLGEKDCGAPCEPTKVYGLMYFGPEEL
HFZ2 GPGGGGAPPRYATLEHPPHFCPRVLKVPYSYKFLGERDCAAPCEPARPDGSMFFSQEET
HFZ3 VQRDYG-----FWCPRELKIDPDLGYSFLHVRDCSPPCP----NMYFR--REEL
MFZ3 VQRDYG-----FWCPRELKIDPDLGYSFLHVRDCSPPCP----NMYFR--REEL
HFZ4 PLPHKTPI-----QPGEECHSVGTNSDQYIWVKRSLNLCVLCGYDAGLY-SRSAK
MFZ4 PLPHKTPI-----QPGEECHSVGSNSDQYIWVKRSLNLCVLCGYDAGLY-SRSAK
HFZ5 ECPAGGPFV-----CKCREPFVPILKESHPLYNKVRTGQVPNCAVPCYOPSFSADER
HFZ6 VQRDIG-----FWCPRHLKTSGGQGYKFLGIDQCAPP CP----NMYFK--SDEL
MFZ6 VPRDIG-----FWCPKHLRTSGDQGYRFLGIEQCAPP CP----NMYFK--SDEL
HFZ7 ASDGRGRPAF-----PFSCPRQLKVPPYLYRFLGERDCGAPCEPGRANGLMYFKEEER
MFZ7 -SDGRGRLSF-----PFSCPRQLKVPPYLYRFLGERDCGAPCEPGRANGLMYFKEEER
HFZ8 ARPPGGGAAP---CEPGCQCRAPMVSVSERHPLYNRVKTGQIANCALPCHNPFFSQDER
MFZ8 ARPPGGGAAP---CEPGCQCRAPMVSVSERHPLYNRVKTGQIANCALPCHNPFFSQDER
HFZ9 PRPARPPG-----DLGPGAGSGTCENPEKFQYVEKSRSCAPRCGPGVEVFWSRDDK
MFZ9 PRPARPPG-----DSAPGPGSGGTCDNPEKFQYVEKSRSCAPRCGPGVEVFWSRDDK
HFZ10 FRPQRPHSAQ---EHPLKDGPGRGGCNDNPGKFHHVEKSASCAPLCTPGVDVYWSREDK

HFZ1 RFSRTWIGIWSVLCCASTLFTVLTYLVDMMRRFSYPERPIIFLSGCTAVAVAYIAGFLL
MFZ1 RFSRTWIGIWSVLCCASTLFTVLTYLVDMPRFSYPERPIISLSGCTAVAVAYIAGFLL
HFZ2 RFARLWILTWSVLCCASTFTTTLTFLVDMQRFYPERPIIFLSGCTMVSVAYIAGFVLQ
HFZ3 SFARYFIGLISIICLSATLFTLFLIDVTRFRYPERPIIFYAVCYMMVSLIFFIGFLL
MFZ3 SFARYFIGLISIICLSATLFTLFLIDVTRFRYPERPIIFYAVCYMMVSLIFFIGFLL
HFZ4 EFTDIWMAVWASLCFISTFTVLTFLIDSSRFSYPERPIIFLSMCYNIYSIAYIVRLTVG
MFZ4 EFTDIWMAVWASLCFISTTFTVLTFLIDSSRFSYPERPIIFLSMCYNIYSIAYIVRLTVG
HFZ5 TFATFWIGLWSVLCFISTSTTVATFLIDMTFRYPERPIIFLSACYLCVSLGFLVRLVVG
HFZ6 EFAKFIGIVSIFCLCATLFTLFLIDVRRFRYPERPIIYYSVCYSIVSLMYFIGFLLG
MFZ6 DFAKFIGIVSIFCLCATLFTLFLIDVRRFRYPERPIIYYSVCYSIVSLMYFVGFLLG
HFZ7 RFARLWVGWWSVLCCASTLFTVLTYLFDMMRRFSYPERPIIFLSGCTFMVAHAVAGFLL
MFZ7 RFARLWVGWWSVLSCASTLFTVLTYLVDMMRRFSYPERPIIFLSGCTFMVAHAVAGFLL
HFZ8 AFTVFWIGLWSVLCFVSTFATVSTFLIDMERFKYPERPIIFLSACYLFVSVGYLVRLVAG
MFZ8 AFTVFWIGLWSVLCFVSTFATVSTFLIDMERFKYPERPIIFLSACYLFVSVGYLVRLVAG
HFZ9 DFALVWMAVWSALCFFSTFTVLTFLLEPHRFQYPERPIIFLSMCYNVYSLAFLIRAVAG
MFZ9 DFALVWMAVWSALCFFSTFTVLTFLLEPHRFQYPERPIIFLSMCYNVYSLAFLIRAVAG
HFZ10 RFAVVWLAIWAVLCFFSSAFTVLTFLIDPARFRYPERPIIFLSMCYCVYSGYLIRLFA

*: :: :. :. :. *. *::: * ***** : ** :: ..

FIG. 8D

1990

TR
TNK

E. coli, *S. aureus*, *P. aeruginosa*

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FIG. 8E

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→ extracellular domain loop 2 ←

HFZ1	ITILALGQVDGDLVSGVCFVGLNVDALRGFVLAPLFVYLFIGTSFLLAGFVSLFRIRTI
MFZ1	ITILALGQVDGDLVSGVCFGLNVDALRGFVLAPLFVYLFIGTSFLLAGFVSLFRIRTI
HFZ2	ITILAMGQIDGDLVSGVCFVGLNSLDPLRGFVLAPLFVYLFIGTSFLLAGFVSLFRIRTI
HFZ3	IILLAMNKIEGDNISGVCFVGLYDVALRYFVLAPLCYVVVGVSLLLAGIISLNRVRIE
MFZ3	IILLAMNKIEGDNISGVCFVGLYDVALRYFVLAPLCYVVVGVSLLLAGIISLNRVRIE
HFZ4	IVILIMRLVDADELTGLCYVGNQNLDAITGFVAPLFTYLVIGTLFIAAGLVALFKIRSN
MFZ4	IVILIMRLVDADELTGLCYVGNQNLDAITGFVAPLFTYLVIGTLFIAAGLVALFKIRSN
HFZ5	ITALALSSVDGDPVAGICYVGNQNLNLRRLGFLVLYLLVGTFLLAGFVSLFRIRSV
HFZ6	VMLLAMNKVEGDNISGVCFVGLYDLASRYFVLLPLCLCVFVGLSLLLAGIISLNHVRQV
MFZ6	VMLLAMNKVEGDNISGVCFVGLYDLASRYFVLLPLCLCVFVGLSLLLAGIISLNHVRQV
HFZ7	ITILAMGQVDGDLVSGVCFVGLSSVDALRGFVLAPLFVYLFIGTSFLLAGFVSLFRIRTI
MFZ7	ITILAMGQVDGDLVSGVCFVGLSSVDALRGFVLAPLFVYLFIGTSFLLAGFVSLFRIRTI
HFZ8	IAVLALSSVDGDPVAGICYVGNQSLDNLRGFVLAPLVIYLFIGTMFLLAGFVSLFRIRSV
MFZ8	IAVLALSSVDGDPVAGICYVGNQSLDNLRGFVLAPLVIYLFIGTMFLLAGFVSLFRIRSV
HFZ9	IVILTLRKVAGDELTGLCYVASTDAAALTGFVLVPLSGYLVLGSSFLTGFVALFHIRKI
MFZ9	IVVLTLRKVAGDELTGLCYVASTDPAALTGFVLVPLSCYLVLGTSFLTGFVALFHIRKI
HFZ10	ILILVMRRVAGDELTGVCYVGSMDVNALTGFVLIPLACYLVIGTSFILSGFVALFHIRRV

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→ extracellular domain loop 3

HFZ1	MKH--DGTKTEKLEKLMVRIGVFSVLYTVPATIVIACYFYEQAFRDQWERSWVAQSCSKSY
MFZ1	MKH--DGTKTEKLEKLMVRIGVFSVLYTVPATIVIACYFYEQAFRDQWERSWVAQSCSKSY
HFZ2	MKH--DGTKTEKLERLMVRIGVFSVLYTVPATIVIACYFYEQAFREHWERSWVSQHCKSL
HFZ3	IPL--EKENQDKLVKFMIRIGVFSILYLVPLLVVIGCYFYEQAYRGIWETTWIQCRCREY
MFZ3	IPL--EKENQDKLVKFMIRIGVFSILYLVPLLVVIGCYFYEQAYRGIWETTWIQCRCREY
HFZ4	LQK--DGTKTDKLERLMVKIGVFSVLYTVPATCVIACYFYEISNWFALFRYSADDSNMAV-
MFZ4	LQK--DGTKTDKLERLMVKIGVFSVLYTVPATCVIACYFYEISNWFALFRYSADDSNMAV-
HFZ5	IKQ--GGTKTDKLEKLMIRIGIFTLLYTPASIVVACYLYEQHYRESWEAALTCACPGHD
HFZ6	IQH--DGRNQEKLEKLMIRIGVFSGLYLVPLVTLGCVVYELVNRTWETWFSDHCHQY
MFZ6	IQH--DGRNQEKLEKLMIRIGVFSGLYLVPLVTLGCVVYELVNRTWETWFSDHCHQY
HFZ7	MKH--DGTKTEKLEKLMVRIGVFSVLYTVPATIVLACYFYEQAFREHWERTWLLQTCKSY
MFZ7	MKH--DGTKTEKLEKLMVRIGVFSVLYTVPATIVLACYFYEQAFREHWERTWLLQTCKSY
HFZ8	IKQQDGPTKTHKLEKLMIRGLFTVLYTPAAVVVACLFYEQHNRPRWEATHNCPCLRDL
MFZ8	IKQQGGPTKTHKLEKLMIRGLFTVLYTPAAVVVACLFYEQHNRPRWEATHNCPCLRDL
HFZ9	MKT--GGTNTEKLEKLMVKIGVFSILYTPATCVIVCYVYERLNMDFWRLRATEQPCTAA
MFZ9	MKT--GGTNTEKLEKLMVKIGVFSILYTPATCVIVCYVYERLNMDFWRLRATEQPCTAA
HFZ10	MKT--GGENTDKLEKLMVRIGLFSVLYTVPATCVIACYFXEHLNMDYWKILAAQHKCKM-

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FIG. 8F

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HFZ1 AIPCPHLQAGGGAPPHPPMSPDFTVFMIKYLMTLIVGITSQFWIWSGKTLNSWRKFYTRL
MFZ1 AIPCPHLQGGGGVPPHPPMSPDFTVFMIKYLMT-----LNSWRKFYTRL
HFZ2 AIPCP-----AHYTPR--MSPDFTVYMIKYLMTLIVGITSQFWIWSGKTLHSWRKFYTRL
HFZ3 HIPCP-----YQVTQMSRPDLILFLMKYLMALIVGIPSVFWVGSKKTCEWASFFHGR
MFZ3 HIPCP-----YQVTQMSRPDLILFLMKYLMALIVGIPSIWVGSKKTCEWASFFHGR
HFZ4 -----EMLKIFMSLLVGITSGMWIWSAKTLHTWQ-KCSNR
MFZ4 -----EMLKIFMSLLVGITSGMWIWSAKTLHTWQ-KCSNR
HFZ5 TGQPR----AK-----PEYVWLMLKYFMCLVVGITSGVWIWSGKTVESWRRFTSRC
HFZ6 HIPCP-----YQAKAKARPELALFMIKYLMTLIVGISAVFWVGSKKTCTEWAGFFKRN
MFZ6 RIPCP-----YQANPKARPELALFMIKYLMTLIVGISAVFWVGSKKTCTEWAGFFKRN
HFZ7 AVPCP----PGHFPPM---SPDFTVFMIKYLMTIVGITTGFVIWSGKTLQSWRRFYHRL
MFZ7 AVPCP----PRHFSPM---SPDFTVFMIKYLMTIVGITTGFVIWSGKTLQSWRRFYHRL
HFZ8 QPDQA----RR-----PDYAVFMLKYFMCLVVGITSGVWVWSGKTLESWSRLCTRC
MFZ8 QPDQA----RR-----PDYAVFMLKYFMCLVVGITSGVWVWSGKTLESWSRALCTRC
HFZ9 AGPGG----RRDCSLPGGSVPTVAVFMLKIFMSLVVGITSGVWVWSKTFQTWQSLCYRK
MFZ9 TVPGG----RRDCSLPGGSVPTVAVFMLKIFMSLVVGITSGVWVWSKTFQTWQSLCYRK
HFZ10 NNQTK----TLDC-LMAASIPAVEIFMVKIFMLLVVGITSGMWIWSKTLQSWQQVCSRR
::* :*

HFZ1 TN--SKQGETTV-----
MFZ1 TN--SKQGETTV-----
HFZ2 TN--SRHGETTV-----
HFZ3 RKKEIVNESRQVLQEP-----DFAQSLLRDPNTPIIRKSRGTSTQGTSTHAS
MFZ3 RKKEIVNESRQVLQEP-----DFAQSLLRDPNTPIIRKSRGTSTQGTSTHAS
HFZ4 LVNSGKVKREKRGNGW-----VKPGKGSE-----
MFZ4 LVNSGKVKREKRGNGW-----VKPGKGNE-----
HFZ5 CC-RPRRGHKSGGA-----MA--AG-D-----
HFZ6 RKRDPISERRVLQESCEFFLKHNSKVHKKKHYPSSHKLKVISKSMGTSTGATANHGT
MFZ6 RKRDPISERRVLQESCEFFLKHNSKVHKKKHGAPGPHRLKVISKSMGTSTGATTNHGT
HFZ7 SH--SSKGETAV-----
MFZ7 SH--SSKGETAV-----
HFZ8 CW-ASKGA AVGGGAGA-----TAAGGGGGPGGGGGGP
MFZ8 CW-ASKGA AVGAGAGG-----SGPGGSGP-----GP
HFZ9 IA--AGRARAKACRAP-----GSYGRGTHC-----
MFZ9 MA--AGRARAKACRTP-----GGYGRGTHC-----
HFZ10 LKKKSRRKPASVITSG-----GIYKKAQH-----

FIG. 8G

Title: IMMUNOLOGIC COMPOSITIONS AND METHODS FOR STUDYING
AND TREATING CANCERS EXPRESSING FRIZZLED ANTIGENS

Inventors: Dennis A. Carson, et al.

Application No.: 09/847,102

Docket No.: 220002062900

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HFZ1 -----
MFZ1 -----
HFZ2 -----
HFZ3 STQLAMVDDQRSKAGSIHVKVSSYHGSLHRSRDGRYTPCSYRG--MEERLPHGSMS-RLT
MFZ3 STQLAMVDDQRSKAGSVHVKVSSYHGSLHRSRDGRYTPCSYRG--MEERLPHGSMS-RLT
HFZ4 -----TVV-----
MFZ4 -----TVV-----
HFZ5 -----YPEASAALTGRTPPGPAATYHKQVSLSHV-----
HFZ6 SAVAITSHDYLQGQETLQTEIQTSPETSMREVKADGASTPRLREQDCGEPASPAASIS-RLS
MFZ6 SAMAIADHDYLGQETSTEVHTSPEASVKEGRADRANTPSAKDRDCGESAGPSSKLSGGRN
HFZ7 -----
MFZ7 -----
HFZ8 GGGGGPGGGGSLYSDVSTGLTWRSGTAS-SVSYPKQMPLSQV-----
MFZ8 GGGGGHGGGGSLYSDVSTGLTWRSGTAS-SVSYPKQMPLSQV-----
HFZ9 -----H---YKAPTIVLHMTKTDPSLENPTHL-----
MFZ9 -----H---YKAPTIVLHMTKTDPSLENPTHL-----
HFZ10 -----PQKT-HHGKYEIPAQSPTCV-----

HFZ1 -----
MFZ1 -----
HFZ2 -----
HFZ3 DHSRHSSSHRLNEQSRHSSIRDLSNNPMTHITHGTSMNRVIEEDGTS-----
MFZ3 DHSRHSSSHRLNEQSRHSSIRDLSNNPMTHITHGTSMNRVIEEDGTS-----
HFZ4 -----
MFZ4 -----
HFZ5 -----
HFZ6 GEQVDGKG--QAGSVSESARSEGRISPKSDITDTGLAQSNLQVPSSSEPSLKGSTSL
MFZ6 GRESRAGGLKERSNGSEGAPSEGRVSPKSSVPETGLIDCSTSQAASSPEPTSLKGSTSLP
HFZ7 -----
MFZ7 -----
HFZ8 -----
MFZ8 -----
HFZ9 -----
MFZ9 -----
HFZ10 -----

FIG. 8H

HFZ1	-----
MFZ1	-----
HFZ2	-----
HFZ3	-----
MFZ3	-----
HFZ4	-----
MFZ4	-----
HFZ5	-----
HFZ6	VHPVSGVRKEQGGGCHSDT
MFZ6	VHSASRARKEQGAGSHSDA
HFZ7	-----
MFZ7	-----
HFZ8	-----
MFZ8	-----
HFZ9	-----

FIG. 8I